

Original Research Article

AVOIDABLE ELECTIVE SURGERY CANCELLATIONS IN KARACHI TERTIARY HOSPITALS: RATES, CAUSES, AND PATIENT-FACTORS

Syeda Fariha Hussain¹, Ushna Shahid², Manal Ahmed³, Shazia Aftab⁴, Hina Ali⁵, Kashaf Shahid⁶

¹Assistant Professor, Department of OBGYN, Jinnah Medical and Dental College / Sohail Trust Hospital Karachi Pakistan.

²House officer, Department of OBGYN, Sohail Trust Hospital and Medicare Cardiac & General Hospital Karachi Pakistan.

³House officer, Department of ENT, Sohail Trust Hospital and Medicare Cardiac & General Hospital Karachi Pakistan.

⁴Professor, Department of OBGYN, Jinnah Medical and Dental College Karachi Pakistan.

⁵Senior Registrar, Department of OBGYN, Jinnah Medical and Dental College Karachi Pakistan.

⁶House officer, Department of Surgery, Sohail Trust Hospital and Medicare Cardiac & General Hospital Karachi Pakistan.

Received : 03/09/2026
Received in revised form : 03/10/2026
Accepted : 18/10/2026

Corresponding Author:

Dr. Syeda Fariha Hussain,

Assistant Professor, Department of
OBGYN, Jinnah Medical and Dental
College / Sohail Trust Hospital Karachi
Pakistan.

Email: fariha.hussain@jmcd.edu.pk

DOI: 10.70034/ijmedph.2026.4.130

Source of Support: Nil,

Conflict of Interest: None declared

Int J Med Pub Health

2026; 16 (4); 868-871

ABSTRACT

Background: Cancellations of elective surgeries represent a significant challenge for healthcare systems worldwide, leading to financial losses, operational inefficiencies, and patient distress. Reported global cancellation rates range from 1.9% to 49%, often reflecting disparities in hospital infrastructure and preoperative preparedness. However, local data from Pakistan remain limited. **Objective:** To determine the frequency, causes, and avoidability of elective surgery cancellations and their association with patient factors in tertiary care hospitals in Karachi. **Materials and Methods:** This cross-sectional study was conducted from April 2023 to July 2024 in the General Surgery, ENT, and Gynecology departments of Sohail Trust Hospital and Medicare Cardiac & General Hospital, Karachi. A total of 200 consecutive patients whose elective surgeries were cancelled on the intended day were included. Data were collected via a structured questionnaire. Reasons for cancellation were categorized as patient-, hospital-, or doctor-related and assessed for avoidability using WHO criteria. Data analysis was done using SPSS v25. **Results:** The mean age was 37.2 ± 16.5 years; 63% were female and 71% from low-income households. Cancellations were predominantly patient-related (49%), followed by hospital-related (38%) and doctor-related (13%). Nearly 59% were avoidable. Older patients (≥ 40 years) experienced more patient-related cancellations (60%), whereas younger patients (< 40 years) had more hospital-related issues (47%, $p = 0.01$). Patient-related cancellations were associated with higher mean age (41.7 ± 13.9 years) compared to hospital-related (32.4 ± 17.4 years, $p = 0.001$).

Conclusion: Nearly two-thirds of elective surgery cancellations in tertiary hospitals were avoidable—predominantly due to patient-related and systemic hospital factors. The findings highlight the critical need for targeted interventions, such as mandatory preoperative assessment clinics, improved resource management, and strong scheduling systems, to reduce the burden of cancellations and improve the quality of surgical care.

Keywords: Elective surgery, cancellation, preoperative assessment, hospital efficiency, Pakistan, avoidable causes.

INTRODUCTION

Cancellations of elective surgeries carry a significant burden on healthcare systems leading to wasted operating room time, increased financial

burdens and patient dissatisfaction but also causing psychological distress.^[1,2] Common reasons for cancellations include incomplete preoperative assessment, inadequate patient counselling, administrative and operating room mistakes.³ Reported global cancellation rates vary widely—

from 1.9% to 49%—depending on institutional resources and healthcare infrastructure.^[4]

A cancellation rate under 5% is regarded as an indicator of high-quality surgical care.^[5] Wong et al. reported overall rate of surgery cancellations of 9.7%.^[6] A study from UK estimated an annual loss of 88 million dollars to National Health System owing to last-minute surgery cancellations.^[7] A West African study from Burkina Faso estimated an additional cost of 19 thousand dollars incurred over three months, approximately 80 dollars per patient due to surgery cancellations.^[8]

In Pakistan found various ranges surgery cancellation from 5.8% to 24.1%, with inadequate operating-theatre time being the leading cause.^[9,10] These disruptions reduce operating theater efficiency as well as public trust on the healthcare system.

Global literature identifies three principal drivers: patient-related (medical unfitness, non-compliance), hospital-related (equipment or blood shortages, scheduling delays), and provider-related (unavailability or last-minute decision changes).^[4-6]

Despite global attention, context-specific evidence from Pakistan remains limited.

Cancellations of elective surgeries have been recognized as a challenge worldwide; there is limited literature from Pakistan addressing the specific drivers of elective surgery cancellations in tertiary hospitals. This study aimed to evaluate the frequency, causes, and patient-related correlates of elective surgery cancellations in tertiary hospitals in Karachi, to support targeted quality-improvement strategies.

MATERIALS AND METHODS

This cross-sectional study was conducted in the General Surgery, ENT, and Gynecology departments of Sohail Trust Hospital and Medicare Cardiac & General Hospital, Karachi, from April 2023 to July 2024. All patients admitted for elective procedures whose surgeries were cancelled on the intended day were included.

A total of 200 patients were consecutively enrolled using convenience sampling. Emergency surgeries and postponements occurring before admission were excluded. Data were collected via a structured, interviewer-administered questionnaire covering demographics, comorbidities, blood requirements, anesthesia plan, and reason for cancellation—classified as:

- **Patient-related:** medical unfitness, non-compliance, acute illness
- **Hospital-related:** unavailability of operating room, blood, staff, or ICU
- **Doctor-related:** surgeon or anesthetist unavailability, last-minute change

Avoidability was categorized using WHO criteria.^[5] Ethical approval was granted by the ERC of Jinnah Medical and Dental College (ERC/STH/23/048). Written informed consent was obtained from all participants. Data were analyzed using SPSS v25.

RESULTS

A total of 200 patients experienced elective surgery cancellations. Mean age was 37.2 ± 16.5 years; 53% were < 40 years. Females constituted 63%, and 71% belonged to low-income groups. Department-wise, 39% were from General Surgery, 31% ENT, and 30% Gynecology. Hypertension and diabetes were the main comorbidities (15.5% and 16%). [Table 1]

Table 1: Socio-demographic and Clinical Characteristics of Patients (n = 200)

Characteristic	Frequency (n)	Percentage (%)
Socioeconomic status		
Low income	142	71.0
Middle/high income	58	29.0
Surgical department		
General Surgery	78	39.0
ENT	62	31.0
Gynecology	60	30.0
Comorbidities		
Hypertension	31	15.5
Diabetes mellitus	32	16.0
Other	16	8.0
None	121	60.5
Blood requirement	71	35.5
Planned anesthesia		
General	179	89.5
Regional/Local	21	10.5

Nearly half (49%) of cancellations were patient-related, 38% hospital-related, and 13% doctor-related. Avoidable causes constituted 59% of all cancellations. [Table 2]

Table 2: Distribution of Cancellations by Cause and Avoidability

Cause of Cancellation	Frequency (n)	Percentage (%)	Avoidable n (%)	Unavoidable n (%)
Patient-related	98	49.0	89 (90.8)	9 (9.2)
Hospital-related	76	38.0	52 (68.4)	24 (31.6)
Doctor-related	26	13.0	17 (65.4)	9 (34.6)
Total	200	100	118 (59.0)	82 (41.0)

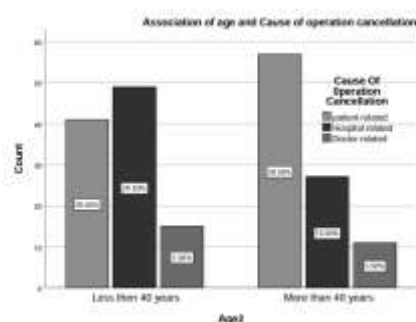
Post hoc Games–Howell analysis confirmed that patients with patient-related cancellations were significantly older than those with hospital-related cancellations (mean difference = 9.22 years, 95%

CI: 3.44–15.00; $p = 0.001$). However, no significant age difference was found between patient- and doctor-related or hospital- and doctor-related groups. [Table 3]

Table 3: Post Hoc Games-Howell Comparisons of Age by Cancellation Cause

Comparison	Mean Difference	95% CI	p-value
Patient vs. Hospital-related	9.22	3.44 – 15.00	0.001
Patient vs. Doctor-related	7.15	-2.68 – 16.98	0.190
Hospital vs. Doctor-related	-2.07	-12.40 – 8.27	0.878

Age association showed patient-related cancellations occurred at higher mean age (41.7 ± 13.9 years) compared with hospital-related (32.4 ± 17.4 years, $p = 0.001$). (Tables 3–4) Patients ≥ 40 years had more patient-related cancellations (60%), whereas those < 40 years faced more hospital-related issues (47%). [Table 4, Figure 1]

**Figure 1: Distribution of cancellation causes by age group**

DISCUSSION

In this study, we found that nearly 60% of elective surgical cancellations were avoidable, with patient-related causes (49%) constituting the largest proportion, followed by hospital-related (38%) and doctor-related causes (13%). Age significantly influenced the type of cancellations, with Older patients more often faced medical unfitness, while younger patients encountered hospital inefficiencies such as limited theatre time or blood shortages.

Results of studies conducted by Ahmad et al. and Zarin et al. show similar findings, who reported that over 70% and 72% of cancellations respectively were patient-related, most commonly due to incomplete medical evaluation and abnormal laboratory reports.^[9,10] Together with our study, these findings highlight a systemic gap in preoperative optimization within Pakistani tertiary care.

Kumar and Gandhi,^[11] identified the lack of available operating room (OT) time (63%) as the predominant reason for cancellation which is in contrast to our data. Comparable to our findings, Kabiraj et al. observed a 15.3% cancellation rate largely driven by administrative and patient-related factors, reaffirming that both systemic and preoperative gaps remain major contributors in tertiary hospitals.^[15]

In contrast, studies from high-income countries report much lower Avoidability. Wong et al. in the UK found that 38% of cancellations were due to hospital organizational failures rather than patient-related issues¹⁶. Likewise, McIntosh et al. highlighted the influence of healthcare financing and hospital policy on cancellation.^[7] These differences support the argument that variability in cancellation rates (ranging 1.9%–49% globally) likely reflects systemic differences between developed and developing countries, patient preparedness and hospital management.

Scheenstra et al,^[12] from a Dutch tertiary cardiac center reported a much lower cancellation rate (14.3%) and found 71.4% process-related and 25.9% medical-related causes. Nearly all of their process-related cancellations (98.6%) were rescheduled within five days, reflecting greater system resilience.

In a 5-year UK study, McKendrick et al,^[13] demonstrated that introducing a structured preoperative assessment clinic significantly reduced same-day surgical cancellations—from 9.7% to 8.6% overall, and from 7.6% to 3.6% for cancellations related to inadequate preparation. Similar to our observation, their results confirm that that structured pre-op evaluation could markedly reduce cancellations.

In an interesting study, Stewart et al. reported zero cancellations among patients using a smartphone-based preoperative instruction app for effective pre-operative communication.^[14]

Our analysis also revealed that hospital-related cancellations (38%) were largely due to blood unavailability, equipment issues or overbooked lists similar to those of Kaddoum et al. in Lebanon,

where 20% of cancellations were resource-related, commonly due to lack of financial clearance or OR delays.^[18]

The age gradient in cancellation patterns in our study has not been well-explored in prior regional literature. Older patients (≥ 40 years) were 1.5 times more likely to have cancellations due to unoptimized chronic illnesses, aligning with findings from Iran and Nigeria, where medical unfitness in older age groups contributed significantly to avoidable cancellation.^[18,19] By contrast, younger patients in our cohort were disproportionately affected by hospital inefficiencies.

Preoperative assessment clinics, as demonstrated in Broullón-Dobarro et al,^[3] in Spain, reduce same-day cancellations significantly. Implementing similar structured assessment pathways in Pakistan could mitigate much of the avoidable burden.

The implications of these avoidable cancellations extend beyond efficiency. Lankoandé et al. from Burkina Faso highlighted the psychological distress and financial strain caused to patients and families by same-day cancellations.^[8] In our setting, where 71% of patients belonged to low-income households, these cancellations likely exacerbate mistrust in the health system and worsen financial hardship.

CONCLUSION

Nearly 60% of elective surgery cancellations in Pakistani tertiary hospitals were avoidable. Patient-related factors, especially comorbidity management, predominated, while hospital inefficiencies such as OT and blood shortages contributed significantly. Mandatory preoperative clinics, regular cancellation audits, digital patient reminders and AI-driven scheduling software are some of the means that can be used to reduce the cancellation, thus reducing the burden on the health system.

Strengths and Limitations

This study adds to scarce Pakistani literature by providing a multi-departmental, age-stratified analysis of cancellation causes. Nevertheless, it is limited by its single-region design and lack of follow-up on long-term patient outcomes. Future multicenter studies across Pakistan are warranted to inform national strategies.

REFERENCES

- Dimitriadis PA, Iyer S, Evgeniou E. The challenge of cancellations on the day of surgery. *Int J Surg*. 2013;11(10):1126-30. doi: 10.1016/j.ijssu.2013.09.002. Epub 2013 Sep 12. PMID: 24035905.
- Nigatu YA, Aytolign HA. Cause and incidence of Cancellation of elective surgeries at Gondar University hospital, Ethiopia. 2020
- Broullón-Dobarro A, Cabadas Avio 'n R, Leal Ruiloba MS et al (2019) Retrospective analysis of suspended surgeries and influencing factors during an 8-year period. *Cir Esp* 97(4):213–221
- Argo JL, Vick CC, Graham LA, Itani KM, Bishop MJ, Hawn MT. Elective surgical case cancellation in the Veterans Health Administration system: identifying areas for improvement. *Am J Surg*. 2009;198:600–6.
- Macario, Alex M.D., M.B.A.. Are Your Hospital Operating Rooms “Efficient”? A Scoring System with Eight Performance Indicators. *Anesthesiology* 105(2):p 237-240, August 1, 2006. | DOI: 10.1097/00005542-200608000-00004
- Sarang B, Bhandoria G, Patil P, Gadgil A, Bains L, Khajanchi M, Kizhakke Veetil D, Dutta R, Shah P, Bhandarkar P, Kaman L, Ghosh D, Mandrelle K, Kumar A, Bahadur A, Krishna S, Gautam KK, Dev Y, Aggarwal M, Thivalapill N, Roy N; IndSurg Collaboration. Assessing the Rates and Reasons of Elective Surgical Cancellations on the Day of Surgery: A Multicentre Study from Urban Indian Hospitals. *World J Surg*. 2022 Feb;46(2):382-390. doi: 10.1007/s00268-021-06364-1. Epub 2021 Nov 16. PMID: 34787712; PMCID: PMC8724145.
- McIntosh B, Cookson G, Jones S (2012) Cancelled surgeries and payment by results in the English National Health Service. *J Health Serv Res Policy* 17(2):79–86. <https://doi.org/10.1258/jhsrp.2011.011053>
- Lankoandé M, Bonkoungou P, Ki BK et al (2017) Economic and psychological burden of scheduled surgery cancellation in a sub Saharan country (Burkina Faso). *South Afr J Anaesth Analg* 23(6):145–151. <https://doi.org/10.1080/22201181.2017.1379788>
- Zarin M, Khan M, Yunus M, Zeb J. Canceled elective general surgical operations in Khyber Teaching Hospital, Peshawar, Pakistan. *RMJ*. (2019), [cited August 06, 2025]; 44(3): 630-633.
- Ahmad M, Akmal M, Khurshid T, Saleem A, Haq IU, Syed FT. AVOIDING SURGERY DAY CANCELLATION BY FINDING PREVENTABLE CAUSES – A TWO YEARS EXPERIENCE. *Pak Armed Forces Med J* [Internet]. 2021 Aug. 26 [cited 2025 Aug. 16];71(4):1400-03
- Kumar R, Gandhi R. Reasons for cancellation of operation on the day of intended surgery in a multidisciplinary 500 bedded hospital. *J Anaesthesiol Clin Pharmacol*. 2012 Jan-Mar;28(1):66–9
- Scheenstra B, Prince'e AMA, Imkamp MSV, Kietselaer B, Ganushchak YM, van't Hof AWJ et al. Last-minute cancellation of adult patients scheduled for cardiothoracic surgery in a large Dutch tertiary care centre. *Eur J Cardiothorac Surg* 2022;61:225–32
- McKendrick DRA, Cumming GP, Lee AJ. A 5-year observational study of cancellations in the operating room: does the introduction of preoperative preparation have an impact? *Saudi J Anaesth* 2014;8:S8–14.
- Stewart JJ, Fayed I, Henault S, Kalantar B, Voyadzis JM. Use of a Smartphone Application for Spine Surgery Improves Patient Adherence with Preoperative Instructions and Decreases Last-minute Surgery Cancellations. *Cureus*. 2019 Mar 6;11(3):e4192. doi: 10.7759/cureus.4192. PMID: 31106092; PMCID: PMC6504025.
- Kabiraj RA, Bhosale JP, Rathore KB, Jadhav PS. Study on cancellation of scheduled surgeries at a tertiary care teaching hospital. *Afr J Bio Sci*. 2024;6(11):484–489. doi:10.33472/AFJBS.6.11.2024.484-489
- Wong DJN, Harris SK, Moonesinghe SR; SNAP-2: EPICCS Collaborators; Health Services Research Centre, National Institute of Academic Anaesthesia; Study Steering Group. Cancelled operations: a 7-day cohort study of planned adult inpatient surgery in 245 UK National Health Service hospitals. *Br J Anaesth* 2018;121:730–8.
- Naderi-Boldaji, V., Banifatemi, M., Zandi, R. et al. Incidence and root causes of surgery cancellations at an academic medical center in Iran: a retrospective cohort study on 29,978 elective surgical cases. *Patient Saf Surg* 17, 24 (2023). <https://doi.org/10.1186/s13037-023-00377-6>
- A. Gajida, I. Takai, and Y. Nuhu, “Cancellations of elective surgical procedures performed at a teaching hospital in north west Nigeria,” *Journal of Medicine in the Tropics*, vol.18, no. 2, pp. 108–112, 2016
- Kaddoum R, Fadlallah R, Hitti E, El-Jardali F, El Eid G. Causes of cancellations on the day of surgery at a tertiary teaching hospital. *BMC Health Serv Res*. 2016;16:259. doi:10.1186/s12913-016-1475-6.